U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

SEARCH REQUEST FORM

11-444

Requestor's Name: L. E. Crane

Serial Number: 09/032,972

Date: 11/16/98 Phone: 308-4639 Art Unit: 1623

8D14

Search Topic:

Please write a detailed statement of search topic. Describe specifically as possible the subject matter to be searched. Define any terms that may have a special meaning. Give examples or relevant citations, authors keywords, etc., if known. For sequences, please attach a copy of the sequence. You may include a copy of the broadest and/or most relevant claim(s).

Please search for oligonucleotide syntheses which are distinguished by their use of aromatic solvents (claims 6 and 910).

STAFF USE ONLY

Used 11/23

Date completed: 11/20

Searcher: Mark X4218

Terminal time: 100

Elapsed time: _____

CPU time: _____

Total time: _____

Number of Searches: _____

Number of Databases: _____

Search Site

_____ STIC
_____ CM-1
_____ Pre-S

Type of Search

_____ N.A. Sequence
_____ A.A. Sequence
_____ Structure
_____ Bibliographic

Vendors

_____ IG Suite
✓ STN
_____ Dialog
_____ APS
_____ Geninfo
_____ SDC
_____ DARC/Questel
_____ Other

Crane 032972

CRA 2 3

```
=> fil caplus,.biotech,wpids,uspatful

COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     0.45       0.45

FILE 'CAPLUS' ENTERED AT 13:37:56 ON 23 NOV 1998
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FILE 'USPATFULL' ENTERED AT 13:37:56 ON 23 NOV 1998
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=> s phosphorus link? oligomer

L1             0 FILE CAPLUS
L2             0 FILE BIOSIS
L3             0 FILE MEDLINE
L4             0 FILE EMBASE
L5             0 FILE WPIDS
L6             0 FILE USPATFULL

TOTAL FOR ALL FILES
L7             0 PHOSPHORUS LINK? OLIGOMER

=> fil reg

COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     9.55      10.00

FILE 'REGISTRY' ENTERED AT 13:39:19 ON 23 NOV 1998
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STRUCTURE FILE UPDATES:  20 NOV  98  HIGHEST RN 214595-33-2
DICTIONARY FILE UPDATES: 22 NOV  98  HIGHEST RN 214595-33-2

TSCA INFORMATION NOW CURRENT THROUGH JUNE 29, 1998

  Please note that search-term pricing does apply when
  conducting SmartSELECT searches.

  Stereochemical name changes have been adopted and appear in CN's
  beginning 6/29/98.  See the online news message for details.

=> s phosphorus/cn
```

```
L8              1 PHOSPHORUS/CN

=> s (phosphodiester or phosphorothioate or phosphorothioate or
"h-phosphonate")/cn

                0 PHOSPHODIESTER/CN
                1 PHOSPHOROTHIOATE/CN
                1 PHOSPHOROTHIOATE/CN
                0 "H-PHOSPHONATE"/CN
L9              1 (PHOSPHODIESTER OR PHOSPHOROTHIOATE OR PHOSPHOROTHIOATE
                  OR "H-PHOSPHONATE")/CN

=> s (benzene or toluene or benzonitrile or "o-xylene" or "m-xylene" or
"p-xylene" or mesitylene or diphenyl ether)/cn

                1 BENZENE/CN
                1 TOLUENE/CN
                1 BENZONITRILE/CN
                1 "O-XYLENE"/CN
                1 "M-XYLENE"/CN
                1 "P-XYLENE"/CN
                1 MESITYLENE/CN
                1 DIPHENYL ETHER/CN
L10             8 (BENZENE OR TOLUENE OR BENZONITRILE OR "O-XYLENE" OR "M-XY
                  LENE" OR "P-XYLENE" OR MESITYLENE OR DIPHENYL ETHER)/CN

=> s (chlorobenzene or benzotirfluoride or benzotrifluoride)/cn

                1 CHLOROBENZENE/CN
                0 BENZOTIRFLUORIDE/CN
                1 BENZOTRIFLUORIDE/CN
L11             2 (CHLOROBENZENE OR BENZOTIRFLUORIDE OR BENZOTRIFLUORIDE)/CN

=> s (trityl or monomethoxy trityl or dimethoxytrityl or trimethoxytrityl or
"2-chlorotrityl" or date or tbtr or "9-phenylxanthine-9-yl" or pixyl or
"3-(p-methoxyphenyl)xanthine-9-yl" or mox)/cn

                1 TRITYL/CN
                0 MONOMETHOXY TRITYL/CN
                0 DIMETHOXYTRITYL/CN
                0 TRIMETHOXYTRITYL/CN
                0 "2-CHLOROTRITYL"/CN
                0 DATE/CN
                0 TBTR/CN
                0 "9-PHENYLXANTHINE-9-YL"/CN
                0 PIXYL/CN
                0 "3-(P-METHOXYPHENYL)XANTHINE-9-YL"/CN
                0 MOX/CN
L12             1 (TRITYL OR MONOMETHOXY TRITYL OR DIMETHOXYTRITYL OR TRIMET
                  HOXYTRITYL OR "2-CHLOROTRITYL" OR DATE OR TBTR OR "9-PHENY
                  LXANTHINE-9-YL" OR PIXYL OR "3-(P-METHOXYPHENYL)XANTHINE-9
                  -YL" OR MOX)/CN

=> fil caplus,.biotech,wpids,uspatful

COST IN U.S. DOLLARS                          SINCE FILE      TOTAL
                                                   ENTRY    SESSION
FULL ESTIMATED COST                               97.56     107.56

FILE 'CAPLUS' ENTERED AT 13:49:56 ON 23 NOV 1998
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FILE 'MEDLINE' ENTERED AT 13:49:56 ON 23 NOV 1998

FILE 'EMBASE' ENTERED AT 13:49:56 ON 23 NOV 1998

FILE 'WPIDS' ENTERED AT 13:49:56 ON 23 NOV 1998

FILE 'USPATFULL' ENTERED AT 13:49:56 ON 23 NOV 1998

=> s (l8 or phosphorus)(w)link?(w)oligomer or l8 or phosphorus

L13 197309 FILE CAPLUS
L14 75215 FILE BIOSIS
L15 38151 FILE MEDLINE
L16 23166 FILE EMBASE
'CN' IS NOT A VALID FIELD CODE
L17 37001 FILE WPIDS
L18 69925 FILE USPATFULL

TOTAL FOR ALL FILES
L19 440767 (L8 OR PHOSPHORUS)(W) LINK?(W) OLIGOMER OR L8 OR PHOSPHORU
S

=> s (phosphodiester or phosphorothioate or phosphorothioate or
"h-phosphonate" or l9 or l19)

L20 205925 FILE CAPLUS
L21 80231 FILE BIOSIS
L22 41857 FILE MEDLINE
L23 26998 FILE EMBASE
'CN' IS NOT A VALID FIELD CODE
L24 37744 FILE WPIDS
L25 72774 FILE USPATFULL

TOTAL FOR ALL FILES
L26 465529 (PHOSPHODIESTER OR PHOSPHOROTHIOATE OR PHOSPHOROTHIOATE
OR "H-PHOSPHONATE" OR L9 OR L19)

=> s (phosphodiester or phosphorothioate or phosphorothioate or
"h-phosphonate" or l9 or l19)

L27 205925 FILE CAPLUS
<------User Break------>
u
SEARCH ENDED BY USER
L28 HAS NO ANSWERS
SEARCH ENDED BY USER

=> del l28 y

=> del l27 y

=> s (benzene or toluene or benzonitrile or "o-xylene" or "m-xylene" or "p-xylene" or mesitylene or diphenyl ether or l10) and l26

L27 3351 FILE CAPLUS
L28 152 FILE BIOSIS
L29 117 FILE MEDLINE
L30 110 FILE EMBASE
'CN' IS NOT A VALID FIELD CODE
L31 1547 FILE WPIDS
L32 34774 FILE USPATFULL

TOTAL FOR ALL FILES
L33 40051 (BENZENE OR TOLUENE OR BENZONITRILE OR "O-XYLENE" OR "M-XY LENE" OR "P-XYLENE" OR MESITYLENE OR DIPHENYL ETHER OR L10) AND L26

=> s (chlorobenzene or benzotirfluoride or benzotrifluoride or l11) and l26

L34 237 FILE CAPLUS
L35 7 FILE BIOSIS
L36 3 FILE MEDLINE
L37 5 FILE EMBASE
'CN' IS NOT A VALID FIELD CODE
L38 131 FILE WPIDS
L39 6299 FILE USPATFULL

TOTAL FOR ALL FILES
L40 6682 (CHLOROBENZENE OR BENZOTIRFLUORIDE OR BENZOTRIFLUORIDE OR L11) AND L26

=> s (trityl or monomethoxy trityl or dimethoxytrityl or trimethoxytrityl or "2-chlorotrityl" or date or tbtr or "9-phenylxanthine-9-yl" or pixyl or "3-(p-methoxyphenyl)xanthine-9-yl" or mox or l12) and (l33 or l40)

L41 18 FILE CAPLUS
L42 0 FILE BIOSIS
L43 1 FILE MEDLINE
L44 0 FILE EMBASE
'CN' IS NOT A VALID FIELD CODE
L45 2 FILE WPIDS
L46 3935 FILE USPATFULL

TOTAL FOR ALL FILES
L47 3956 (TRITYL OR MONOMETHOXY TRITYL OR DIMETHOXYTRITYL OR TRIMET HOXYTRITYL OR "2-CHLOROTRITYL" OR DATE OR TBTR OR "9-PHENY LXANTHINE-9-YL" OR PIXYL OR "3-(P-METHOXYPHENYL)XANTHINE-9 -YL" OR MOX OR L12) AND (L33 OR L40)

=> fil reg

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	83.81	191.37

FILE 'REGISTRY' ENTERED AT 14:00:08 ON 23 NOV 1998

STRUCTURE FILE UPDATES: 20 NOV 98 HIGHEST RN 214595-33-2

DICTIONARY FILE UPDATES: 22 NOV 98 HIGHEST RN 214595-33-2

TSCA INFORMATION NOW CURRENT THROUGH JUNE 29, 1998

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Stereochemical name changes have been adopted and appear in CN's beginning 6/29/98. See the online news message for details.

=> s (protic acid or formic acid or acetic acid or chloroacetic acid or dichloroacetic acid or trichloroacetic or trifluoroacetic acid or benzenesulfonic acid or toluenesulfonic acid or phenylphosphoric acid)/cn

```
             0 PROTIC ACID/CN
             1 FORMIC ACID/CN
             1 ACETIC ACID/CN
             1 CHLOROACETIC ACID/CN
             1 DICHLOROACETIC ACID/CN
             0 TRICHLOROACETIC/CN
             1 TRIFLUOROACETIC ACID/CN
             1 BENZENESULFONIC ACID/CN
             2 TOLUENESULFONIC ACID/CN
             0 PHENYLPHOSPHORIC ACID/CN
L48          8 (PROTIC ACID OR FORMIC ACID OR ACETIC ACID OR CHLOROACETIC
               ACID OR DICHLOROACETIC ACID OR TRICHLOROACETIC OR TRIFLUO
               ROACETIC ACID OR BENZENESULFONIC ACID OR TOLUENESULFONIC
               ACID OR PHENYLPHOSPHORIC ACID)/CN
```

=> fil caplus,.biotech,wpids,uspatful

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	34.64	226.01

FILE 'CAPLUS' ENTERED AT 14:01:23 ON 23 NOV 1998
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FILE 'USPATFULL' ENTERED AT 14:01:23 ON 23 NOV 1998
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=> s (protic acid or formic acid or acetic acid or chloroacetic acid or dichloroacetic acid or trichloroacetic or trifluoroacetic acid or benzenesulfonic acid or toluenesulfonic acid or phenylphosphoric acid or l48) and l47

```
L49          2 FILE CAPLUS
L50          0 FILE BIOSIS
```

```
L51           0 FILE MEDLINE
L52           0 FILE EMBASE
'CN' IS NOT A VALID FIELD CODE
L53           0 FILE WPIDS
L54        2911 FILE USPATFULL

TOTAL FOR ALL FILES
L55        2913 (PROTIC ACID OR FORMIC ACID OR ACETIC ACID OR CHLOROACETIC
                 ACID OR DICHLOROACETIC ACID OR TRICHLOROACETIC OR TRIFLUO
                ROACETIC ACID OR BENZENESULFONIC ACID OR TOLUENESULFONIC
                ACID OR PHENYLPHOSPHORIC ACID OR L48) AND L47

=> fil reg;s (methanol or ethanol or "2-propanol" or "t-butyl alcohol" or
"t-amyl alcohol" or benzyl alcohol or "1,1,1,3,3,3-hexafluoro-2-propanol")/cn

COST IN U.S. DOLLARS                                  SINCE FILE      TOTAL
                                                         ENTRY    SESSION
FULL ESTIMATED COST                                      39.78     265.79

FILE 'REGISTRY' ENTERED AT 14:10:51 ON 23 NOV 1998
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STRUCTURE FILE UPDATES:  20 NOV  98  HIGHEST RN 214595-33-2
DICTIONARY FILE UPDATES: 22 NOV  98  HIGHEST RN 214595-33-2

TSCA INFORMATION NOW CURRENT THROUGH JUNE 29, 1998

  Please note that search-term pricing does apply when
  conducting SmartSELECT searches.

  Stereochemical name changes have been adopted and appear in CN's
  beginning 6/29/98.  See the online news message for details.


             1 METHANOL/CN
             1 ETHANOL/CN
             1 "2-PROPANOL"/CN
             0 "T-BUTYL ALCOHOL"/CN
             0 "T-AMYL ALCOHOL"/CN
             1 BENZYL ALCOHOL/CN
             1 "1,1,1,3,3,3-HEXAFLUORO-2-PROPANOL"/CN
L56          5 (METHANOL OR ETHANOL OR "2-PROPANOL" OR "T-BUTYL ALCOHOL"
               OR "T-AMYL ALCOHOL" OR BENZYL ALCOHOL OR "1,1,1,3,3,3-HEXA
               FLUORO-2-PROPANOL")/CN

=> fil caplus,.biotech,wpids,uspatful

COST IN U.S. DOLLARS                                  SINCE FILE      TOTAL
                                                         ENTRY    SESSION
FULL ESTIMATED COST                                      24.12     289.91

FILE 'CAPLUS' ENTERED AT 14:11:03 ON 23 NOV 1998
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FILE 'USPATFULL' ENTERED AT 14:11:03 ON 23 NOV 1998
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=> fil reg;s (methanol or ethanol or "2-propanol" or "t-butyl alcohol" or "t-amyl alcohol" or benzyl alcohol or "1,1,1,3,3,3-hexafluoro-2-propanol" or 156) and 155

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	5.62	295.53

FILE 'REGISTRY' ENTERED AT 14:11:24 ON 23 NOV 1998
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STRUCTURE FILE UPDATES: 20 NOV 98 HIGHEST RN 214595-33-2
DICTIONARY FILE UPDATES: 22 NOV 98 HIGHEST RN 214595-33-2

TSCA INFORMATION NOW CURRENT THROUGH JUNE 29, 1998

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Stereochemical name changes have been adopted and appear in CN's beginning 6/29/98. See the online news message for details.

PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'HOSPHORUS)(W) LINK?'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'LINK?(W) OLIGOMER'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'HOSPHORUS)(W) LINK?'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'LINK?(W) OLIGOMER'
194360 METHANOL
<------User Break------>

85582 "PROPANOLL"u
SEARCH ENDED BY USER

=> fil caplus,.biotech,wpids,uspatful;s (methanol or ethanol or "2-propanol" or "t-butyl alcohol" or "t-amyl alcohol" or benzyl alcohol or "1,1,1,3,3,3-hexafluoro-2-propanol" or 156) and 155

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.32	295.85

FILE 'CAPLUS' ENTERED AT 14:12:01 ON 23 NOV 1998
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FILE 'BIOSIS' ENTERED AT 14:12:01 ON 23 NOV 1998

FILE 'MEDLINE' ENTERED AT 14:12:01 ON 23 NOV 1998

FILE 'EMBASE' ENTERED AT 14:12:01 ON 23 NOV 1998

FILE 'WPIDS' ENTERED AT 14:12:01 ON 23 NOV 1998

FILE 'USPATFULL' ENTERED AT 14:12:01 ON 23 NOV 1998


```
L57           1 FILE CAPLUS
L58           0 FILE BIOSIS
L59           0 FILE MEDLINE
L60           0 FILE EMBASE
'CN' IS NOT A VALID FIELD CODE
L61           0 FILE WPIDS
L62        2778 FILE USPATFULL

TOTAL FOR ALL FILES
L63        2779 (METHANOL OR ETHANOL OR "2-PROPANOL" OR "T-BUTYL ALCOHOL"
                OR "T-AMYL ALCOHOL" OR BENZYL ALCOHOL OR "1,1,1,3,3,3-HEXA
                FLUORO-2-PROPANOL" OR L56) AND L55

=> s oligonulceotide and l63

L64           0 FILE CAPLUS
L65           0 FILE BIOSIS
L66           0 FILE MEDLINE
L67           0 FILE EMBASE
L68           0 FILE WPIDS
L69           1 FILE USPATFULL

TOTAL FOR ALL FILES
L70           1 OLIGONULCEOTIDE AND L63

=> d cbib abs
```

L70 ANSWER 1 OF 1 USPATFULL
93:44375 Oligonucleotide analogs containing sulfur linkages.
Benner, Steven A., Grossmannstrasse 16, #7, CH-8049 Zurich, Switzerland
US 5216141 930601
APPLICATION: US 88-202528 880606 (7)
DOCUMENT TYPE: Utility.
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Analogs of DNA containing sulfides, sulfoxides, and sulfones as linking groups between subunits capable of forming bonds with natural oligonucleotides are described. The analogs are lipophilic, stable to chemical degradation under a wide range of conditions and stable to enzymatic degradation in vivo.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

```
=> s l63 and aromatic

L71           0 FILE CAPLUS
L72           0 FILE BIOSIS
L73           0 FILE MEDLINE
L74           0 FILE EMBASE
L75           0 FILE WPIDS
L76        2013 FILE USPATFULL

TOTAL FOR ALL FILES
L77        2013 L63 AND AROMATIC

=> s l77 and synthes?

L78           0 FILE CAPLUS
L79           0 FILE BIOSIS
L80           0 FILE MEDLINE
L81           0 FILE EMBASE
L82           0 FILE WPIDS
L83        1391 FILE USPATFULL

TOTAL FOR ALL FILES
L84        1391 L77 AND SYNTHES?

=> s krotz a?/au,in;s ravikumar v?/au,in

L85          20 FILE CAPLUS
'IN' IS NOT A VALID FIELD CODE
L86          16 FILE BIOSIS
'IN' IS NOT A VALID FIELD CODE
L87           0 FILE MEDLINE
'IN' IS NOT A VALID FIELD CODE
L88          10 FILE EMBASE
L89           0 FILE WPIDS
L90           0 FILE USPATFULL

TOTAL FOR ALL FILES
L91          46 KROTZ A?/AU,IN


L92          87 FILE CAPLUS
'IN' IS NOT A VALID FIELD CODE
L93          35 FILE BIOSIS
'IN' IS NOT A VALID FIELD CODE
L94           9 FILE MEDLINE
'IN' IS NOT A VALID FIELD CODE
L95          33 FILE EMBASE
L96          12 FILE WPIDS
L97           9 FILE USPATFULL

TOTAL FOR ALL FILES
L98         185 RAVIKUMAR V?/AU,IN

=> s l91 and l98

L99           7 FILE CAPLUS
L100          6 FILE BIOSIS
L101          0 FILE MEDLINE
L102          6 FILE EMBASE
L103          0 FILE WPIDS
L104          0 FILE USPATFULL
```

TOTAL FOR ALL FILES
L105 19 L91 AND L98

=> s l105 and l77

L106 0 FILE CAPLUS
L107 0 FILE BIOSIS
L108 0 FILE MEDLINE
L109 0 FILE EMBASE
L110 0 FILE WPIDS
L111 0 FILE USPATFULL

TOTAL FOR ALL FILES
L112 0 L105 AND L77

=> dup rem l105

PROCESSING COMPLETED FOR L105
L113 7 DUP REM L105 (12 DUPLICATES REMOVED)

=> d 1-7 cbib abs

L113 ANSWER 1 OF 7 CAPLUS COPYRIGHT 1998 ACS DUPLICATE 1
1997:386903 Document No. 127:81730 On the formation of longmers in phosphorothioate oligodeoxyribonucleotide synthesis. **Krotz, Achim H.**; Klopchin, Patrick G.; Walker, Kathleen L.; Srivatsa, G. Susan; Cole, Douglas L.; **Ravikumar, Vasulinga T.** (Isis Pharmaceuticals, Inc., Carlsbad, CA, 92008, USA). Tetrahedron Lett., 38(22), 3875-3878 (English) 1997. CODEN: TELEAY. ISSN: 0040-4039. Publisher: Elsevier.

AB The extent of longmer formation in phosphorothioate oligodeoxyribonucleotide synthesis through amidite chem. on solid support depends on base compn., contact time and acidity of the promotor used for activation of the phosphoramidite. A longmer formation mechanism that involves dedimethoxytritylation of the phosphite triester intermediate is proposed.

L113 ANSWER 2 OF 7 CAPLUS COPYRIGHT 1998 ACS DUPLICATE 2
1997:758256 Document No. 128:34970 Improved impurity profile of phosphorothioate oligonucleotides through the use of dimeric phosphoramidite synthons. **Krotz, Achim H.**; Klopchin, Patrick; Cole, Douglas L.; **Ravikumar, Vasulinga T.** (Isis Pharmaceuticals, Carlsbad, CA, 92008, USA). Nucleosides Nucleotides, 16(7-9), 1637-1640 (English) 1997. CODEN: NUNUD5. ISSN: 0732-8311. Publisher: Marcel Dekker, Inc..

AB Phosphorothioate oligonucleotides synthesized through assembly of dimeric phosphoramidite synthons show a significantly improved impurity profile compared to oligomers synthesized through coupling of std. monomer phosphoramidites. A greater than 70% redn. of the (n-1)-mer population and a ca. 50% redn. of phosphodiester linkages has been achieved.

L113 ANSWER 3 OF 7 CAPLUS COPYRIGHT 1998 ACS DUPLICATE 3
1997:758228 Document No. 128:48457 Solution phase synthesis of an oligodeoxyribonucleotide phosphorothioate for therapeutic applications. Cheruvallath, Z. S.; **Krotz, A. H.**; Cole, D. L.; **Ravikumar, V. T.** (Isis Pharmaceuticals, Carlsbad, CA, 92008, USA). Nucleosides Nucleotides, 16(7-9), 1625-1628 (English) 1997. CODEN: NUNUD5. ISSN: 0732-8311. Publisher: Marcel Dekker,

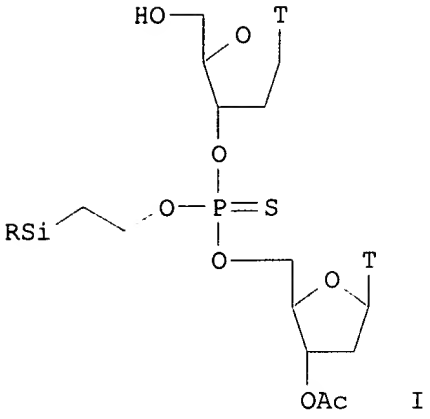
Inc..
AB Soln. phase prepn. of an oligodeoxyribonucleotide phosphorothioate octamer (5'-TTGGGGTT) using phosphorothioate triester method is reported.

L113 ANSWER 4 OF 7 CAPLUS COPYRIGHT 1998 ACS DUPLICATE 4
1997:56328 Document No. 126:199774 Phosphorothioate oligonucleotides: largely reduced (N-1)-mer and phosphodiester content through the use of dimeric phosphoramidite synthons. **Krotz, Achim H.**; Klopchin, Partick; Cole, Douglas L.; **Ravikumar, Vasulinga T.** (Isis Pharmaceuticals, Carlabad, CA, 92008, USA). Bioorg. Med. Chem. Lett., 7(1), 73-78 (English) 1997. CODEN: BMCLE8. ISSN: 0960-894X. Publisher: Elsevier.
AB Phosphorothioate oligonucleotides synthesized through an assembly of dimeric phosphoramidite synthons on controlled pore glass solid support show a significantly improved impurity profile compared to oligomers synthesized through a coupling of std. monomer phosphoramidites. A greater than 70% redn. of the (n-1)-mer population and a ca 50% redn. of phosphodiester linkages has been achieved.

L113 ANSWER 5 OF 7 CAPLUS COPYRIGHT 1998 ACS DUPLICATE 5
1996:182528 Document No. 124:343947 Synthesis and deprotection of .beta.-silylethyl protected O,O,O- and O,O,S-trialkylphosphorothioates. **Krotz, Achim H.**; Cole, Douglas L.; **Ravikumar, Vasulinga T.** (Isis Pharmaceuticals, Carlsbad, CA, 92008, USA). Tetrahedron Lett., 37(12), 1999-2002 (English) 1996. CODEN: TELEAY. ISSN: 0040-4039.
AB Functionalized 2-(diphenylmethylsilyl)ethyl protected thymidyl-thymidine phosphorothioate dimers are easily accessible and stable under conditions used in oligophosphorothioate synthesis. Deprotection with ammonium hydroxide occurs through .beta.-fragmentation and rearrangement. Methylamine and tetrabutylammonium fluoride rapidly and selectively remove the DPSE protecting group of O,O,O- and O,O,S-trialkylphosphorothioates.

L113 ANSWER 6 OF 7 CAPLUS COPYRIGHT 1998 ACS DUPLICATE 6
1995:825822 Document No. 124:56538 Process improvement chemistry (PIC). 7. Efficient synthesis of deoxyribonucleotide phosphorothioates by the use of DMT cation scavenger. **Ravikumar, Vasulinga T.**; **Krotz, Achim H.**; Cole, Douglas L. (Isis Pharmaceuticals, Karlovy Vary, CA, 92008, USA). Tetrahedron Lett., 36(37), 6587-90 (English) 1995. CODEN: TELEAY. ISSN: 0040-4039. OTHER SOURCES: CASREACT 124:56538.
AB Triethylsilane in the presence of dichloroacetic acid in dichloromethane is an efficient DMT cation scavenger during the synthesis of deoxyribonucleotide phosphorothioates and leads to increased overall yields.

L113 ANSWER 7 OF 7 CAPLUS COPYRIGHT 1998 ACS
1995:957193 Document No. 124:176759 Phosphorothioates: .beta.-fragmentation versus .beta.-silicon effect. **Krotz, Achim H.**; Wheeler, Patrick; **Ravikumar, Vasulinga T.** (Isis Pharmaceuticals, Karlovy vary, CA, 92008, USA). Angew. Chem., Int. Ed. Engl., 34(21), 2406-9 (English) 1995. CODEN: ACIEAY. ISSN: 0570-0833.
GI



I

AB Prepn. and rearrangement and .beta.-fragmentation vs. .beta.-silicon effect of oligodeoxyribonucleotide dimer phosphorothioates I (R = Me3, Et3, Me2CMe3, MePh2, T = thymine) are reported.

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=> s (l91 or l98) and l63

L114          0 FILE CAPLUS
L115          0 FILE BIOSIS
L116          0 FILE MEDLINE
L117          0 FILE EMBASE
L118          0 FILE WPIDS
L119          5 FILE USPATFULL

TOTAL FOR ALL FILES
L120          5 (L91 OR L98) AND L63

=> s l120 not l105

L121          0 FILE CAPLUS
L122          0 FILE BIOSIS
L123          0 FILE MEDLINE
L124          0 FILE EMBASE
L125          0 FILE WPIDS
L126          5 FILE USPATFULL

TOTAL FOR ALL FILES
L127          5 L120 NOT L105

=> d 1-5 cbib abs


L127 ANSWER 1 OF 5  USPATFULL
1998:12136 Use of carbocation scavenger during oligonucleotide synthesis.
    Ravikumar, Vasulinga, Carlsbad, CA, United States
    Andrade, Mark, Carlsbad, CA, United States
    Mulvey, Dennis, Conroe, TX, United States
    Cole, Douglas L., San Diego, CA, United States
    ISIS Pharmaceuticals, Inc., Carlsbad, CA, United States (U.S.
    corporation)
    US 5714597 980203
    APPLICATION: US 96-613036  960308 (8)
    DOCUMENT TYPE: Utility.
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
```

AB During the synthesis of oligonucleotides and phosphate linked oligomers, a carbocation scavenging agent is employed to increase the overall yield. The carbocation scavenging agent is used in conjunction with an acidic solution employed during the deprotection step.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L127 ANSWER 2 OF 5 USPATFULL
1998:1901 Oligomeric phosphite, **phosphodiester**, **Phosphorothioate** and phosphorodithioate compounds and intermediates for preparing same.
Ravikumar, Vasulinga T., Carlsbad, CA, United States
ISIS Pharmaceuticals, Inc., Carlsbad, CA, United States (U.S. corporation)
US 5705621 980106
APPLICATION: US 95-560540 951117 (8)
DOCUMENT TYPE: Utility.
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Synthetic processes are provided wherein oligomeric compounds are prepared having **phosphodiester, phosphorothioate**, and phosphorodithioate covalent linkages. Also provided are synthetic intermediates useful in such processes.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L127 ANSWER 3 OF 5 USPATFULL
97:25133 Process for preparing oligonucleotides using silyl-containing diamino phosphorous reagents.
Ravikumar, Vasulinga T., Carlsbad, CA, United States
Mulvey, Dennis, Vista, CA, United States
Cole, Douglas L., San Diego, CA, United States
Cook, Phillip D., Carlsbad, CA, United States
ISIS Pharmaceuticals, Inc., Carlsbad, CA, United States (U.S. corporation)
US 5614621 970325
APPLICATION: US 93-99075 930729 (8)
DOCUMENT TYPE: Utility.
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Synthetic processes are provided wherein substituted silylalkyl phosphoramidites serve as coupling reagents for preparing phosphate, **phosphorothioate**, and other phosphorous-containing covalent linkages. Also provided are synthetic intermediates useful in such processes.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L127 ANSWER 4 OF 5 USPATFULL
96:82817 Lactam nucleic acids.
Ravikumar, Vasulinga, Carlsbad, CA, United States
Mohan, Venkatraman, Carlsbad, CA, United States
ISIS Pharmaceuticals, Inc., Carlsbad, CA, United States (U.S. corporation)
US 5554746 960910
APPLICATION: US 94-243368 940516 (8)
DOCUMENT TYPE: Utility.
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Novel .beta.-lactam monomers bearing various functional groups are prepared. The novel .beta.-lactam monomers can be joined into oligomeric compounds such as via preferred phosphate linkages including **phosphodiester** and **phosphorothioate**

linkages. Useful functional groups include nucleobases as well as polar groups, hydrophobic groups, ionic groups, aromatic groups and/or groups that participate in hydrogen bonding. The oligomeric compounds are useful as diagnostic and research reagents.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L127 ANSWER 5 OF 5 USPATFULL
96:34251 Carbocation scavenging during oligonucleotide synthesis.
Ravikumar, Vasulinga, Carlsbad, CA, United States
Andrade, Mark, Carlsbad, CA, United States
Mulvey, Dennis, Conroe, TX, United States
Cole, Douglas L., San Diego, CA, United States
Isis Pharmaceuticals, Inc., Carlsbad, CA, United States (U.S. corporation)
US 5510476 960423
APPLICATION: US 94-271181 940707 (8)
DOCUMENT TYPE: Utility.
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB During the synthesis of oligonucleotides and phosphate linked oligomers, a carbocation scavenging agent is employed to increase the overall yield. The carbocation scavenging agent is used in conjunction with an acidic solution employed during the deprotection step.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=> dis his

L14 ANSWER 1 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 1999:613524 SCISEARCH
GA The Genuine Article (R) Number: 222VK
TI A simple solid-phase based purification procedure for oligodeoxynucleotides
REC Reference Count: 4
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
STP KeyWords Plus (R): SYNTHETIC OLIGONUCLEOTIDES
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L14 ANSWER 2 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 1998:10974 SCISEARCH
GA The Genuine Article (R) Number: YL589
TI Chemical synthesis and characterization of branched oligodeoxyribonucleotides (bDNA) for use as signal amplifiers in nucleic acid quantification assays
REC Reference Count: 19
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
STP KeyWords Plus (R): DNA; RNA
RF 95-5061 001; STRUCTURAL GENE; GLTC-DEPENDENT REGULATION OF BACILLUS-SUBTILIS GLUTAMATE SYNTHASE EXPRESSION; ARABIDOPSIS TYPE-1 PROTEIN PHOSPHATASE
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L14 ANSWER 3 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 1998:10973 SCISEARCH
GA The Genuine Article (R) Number: YL589
TI An improved divergent synthesis of comb-type branched oligodeoxyribonucleotides (bDNA) containing multiple secondary sequences
REC Reference Count: 36
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
STP KeyWords Plus (R): PROTECTING GROUP; NUCLEIC-ACIDS; DNA; OLIGONUCLEOTIDES; CLEAVAGE; INVITRO; ANALOGS
RF 95-5061 001; STRUCTURAL GENE; GLTC-DEPENDENT REGULATION OF BACILLUS-SUBTILIS GLUTAMATE SYNTHASE EXPRESSION; ARABIDOPSIS TYPE-1 PROTEIN PHOSPHATASE
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L14 ANSWER 4 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 97:605731 SCISEARCH
GA The Genuine Article (R) Number: XP995
TI A branched DNA signal amplification assay for quantification of nucleic acid targets below 100 molecules/ml
REC Reference Count: 42
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
STP KeyWords Plus (R): CHRONIC HEPATITIS-C; POLYMERASE CHAIN-REACTION; VIRUS-RNA LEVEL; IN-SITU; CHEMI-LUMINESCENT; BASE-PAIR; ENZYMATIC INCORPORATION; ALKALINE-PHOSPHATASE; HIV-1 INFECTION; HYBRIDIZATION
RF 95-1959 002; RNA WORLD; EARLY EVOLUTION; IN-VITRO SELECTION; COMBINATORIAL DRUG DISCOVERY; RANDOM NUCLEIC-ACID SEQUENCES; MOLECULAR RECOGNITION
95-2177 002; CHEMILUMINESCENT DETECTION; BRANCHED DNA SIGNAL AMPLIFICATION ASSAY; SENSITIVE QUANTIFICATION; LABEL ENZYME FOR BIOLUMINESCENT ENZYME-IMMUNOASSAY
95-0003 001; HEPATITIS-C VIRUS; HCV GENOTYPES IN SWEDISH BLOOD-DONORS; 5' NONCODING REGION OF THE VIRAL GENOME
95-1297 001; HUMAN-IMMUNODEFICIENCY-VIRUS TYPE-1; DIFFERENTIAL V3 LOOP EPITOPE EXPOSURE OF ISOLATES DISPLAYING DISTINCT TROPISM; HIV POPULATION-DYNAMICS IN-VIVO

95-3818 001; LONG-TERM SURVIVORS OF HUMAN-IMMUNODEFICIENCY-VIRUS TYPE-1 INFECTION; HIV DISEASE; CD8+ NEF-SPECIFIC CYTOTOXIC T-CELLS IN VACCINATED MACAQUES
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L14 ANSWER 5 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 97:279112 SCISEARCH
GA The Genuine Article (R) Number: WP185
TI Chemical synthesis of branched oligodeoxyribonucleotides. Design and synthesis of branching monomer and characterization of oligomers for use as amplifiers in nucleic acid quantification assays.
REC Reference Count: 0
CC CHEMISTRY

L14 ANSWER 6 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 94:258357 SCISEARCH
GA The Genuine Article (R) Number: NH740
TI CONSTRUCTION OF BRANCHED DNA (BDNA) MOLECULES BY CHEMICAL LIGATION
REC Reference Count: 21
CC CHEMISTRY, ORGANIC; CHEMISTRY, CLINICAL & MEDICINAL
STP KeyWords Plus (R): CYANOGEN-BROMIDE; PHOSPHODIESTER BOND; DUPLEXES; OLIGODEOXYRIBONUCLEOTIDES; BINDING; RNA
RF 92-2113 001; DNA CLEAVAGE; ACTIVE-SITE TYROSINE; RAPID DEPROTECTION OF SYNTHETIC OLIGONUCLEOTIDES
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L14 ANSWER 7 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 93:460498 SCISEARCH
GA The Genuine Article (R) Number: LP728
TI DENDRIMER DEVELOPMENT
REC Reference Count: 5
CC MULTIDISCIPLINARY SCIENCES

L14 ANSWER 8 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 91:341985 SCISEARCH
GA The Genuine Article (R) Number: FQ570
TI IMPROVED METHODS FOR THE SYNTHESIS OF BRANCHED DNA (BDNA) FOR USE AS AMPLIFICATION MULTIMERS IN BIOASSAYS
REC Reference Count: 2
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L14 ANSWER 9 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 91:341964 SCISEARCH
GA The Genuine Article (R) Number: FQ570
TI CONTROLLED CHEMICAL CLEAVAGE OF SYNTHETIC DNA AT SPECIFIC SITES
REC Reference Count: 8
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
STP KeyWords Plus (R): OLIGODEOXYNUCLEOTIDES; HYDROLYSIS
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L14 ANSWER 10 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 89:482159 SCISEARCH
GA The Genuine Article (R) Number: AQ048
TI FORKS AND COMBS AND DNA - THE SYNTHESIS OF BRANCHED OLIGODEOXYRIBONUCLEOTIDES
REC Reference Count: 26
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
RF 89-1338 001; SOLID-PHASE PEPTIDE-SYNTHESIS; SELECTIVE AMINO PROTECTING

GROUP; 3'-TERMINAL HALF OF YEAST ALANINE TRANSFER RIBONUCLEIC-ACID (TRANSFER RNAALA)
89-2127 001; INSITU HYBRIDIZATION; DETECTION SENSITIVITY; NON-RADIOACTIVE DNA PROBES
89-5974 001; PRE-MESSENGER RNA SPLICING MUTANTS; U5 SMALL NUCLEAR RIBONUCLEOPROTEIN; ALTERNATIVE USE
89-7401 001; SINGLE BASE MISMATCHES IN DNA; SOLID-PHASE SYNTHESIS OF OLIGONUCLEOTIDES; NONRADIOACTIVE LABELS; EFFICIENT PURIFICATION

L14 ANSWER 11 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 89:430713 SCISEARCH
GA The Genuine Article (R) Number: AK379
TI THE SYNTHESIS OF BRANCHED OLIGONUCLEOTIDES AS SIGNAL AMPLIFICATION MULTIMERS FOR USE IN NUCLEIC-ACID ASSAYS
REC Reference Count: 2
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
RF 89-2127 001; INSITU HYBRIDIZATION; DETECTION SENSITIVITY; NON-RADIOACTIVE DNA PROBES

L14 ANSWER 12 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 89:15356 SCISEARCH
GA The Genuine Article (R) Number: R6154
TI SOLID SUPPORTED HYDROLYSIS OF APURINIC SITES IN SYNTHETIC OLIGONUCLEOTIDES FOR RAPID AND EFFICIENT PURIFICATION ON REVERSE-PHASE CARTRIDGES
REC Reference Count: 29
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
RF 89-7401 002; SINGLE BASE MISMATCHES IN DNA; SOLID-PHASE SYNTHESIS OF OLIGONUCLEOTIDES; NONRADIOACTIVE LABELS; EFFICIENT PURIFICATION
89-0234 001; FLUORESCENT LANTHANIDE COMPLEXES; ION SOLVATION; SYNTHETIC OLIGONUCLEOTIDES; EUROPIUM PERCHLORATE; SOLID SUPPORT; CONTRAST AGENTS; NONRADIOACTIVE LABELS
89-1338 001; SOLID-PHASE PEPTIDE-SYNTHESIS; SELECTIVE AMINO PROTECTING GROUP; 3'-TERMINAL HALF OF YEAST ALANINE TRANSFER RIBONUCLEIC-ACID (TRANSFER RNAALA)

L14 ANSWER 13 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 88:329991 SCISEARCH
GA The Genuine Article (R) Number: N7763
TI A COMPARISON OF NON-RADIOISOTOPIC HYBRIDIZATION ASSAY-METHODS USING FLUORESCENT, CHEMI-LUMINESCENT AND ENZYME LABELED SYNTHETIC OLIGODEOXYRIBONUCLEOTIDE PROBES
REC Reference Count: 46
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
RF 88-1699 003; MPTP NEUROTOXICITY; RAT STRIATAL SLICES; 1-METHYL-4-PHENYLPYRIDINIUM (MPP+) INCREASES OXIDATION; NIGROSTRIATAL DOPAMINE PATHWAY
88-0225 002; DNA FRAGMENTS; SOLID-PHASE SYNTHESIS OF ALPHA-ANOMERIC OLIGODEOXYRIBONUCLEOTIDES; PHOSPHORAMIDITE INTERMEDIATES; RAPID NUCLEOTIDE SEQUENCING
88-0185 001; HIGHLY SENSITIVE THYROTROPIN ASSAY; PRIMARY SCLEROSING CHOLANGITIS; MANAGEMENT OF THYROXINE REPLACEMENT; NONTHYROIDAL ILLNESS
88-4245 001; SINGLE NEURONS OF THE RAT HYPOTHALAMUS; CALCITONIN GENE-RELATED PEPTIDE; CENTRAL AMYGDALOID NUCLEUS; INTRAOCULAR SPINAL-CORD GRAFTS

L14 ANSWER 14 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 88:127755 SCISEARCH
GA The Genuine Article (R) Number: M3040
TI A NOVEL METHOD FOR THE RAPID DETECTION OF SPECIFIC NUCLEOTIDE-SEQUENCES IN

CRUDE BIOLOGICAL SAMPLES WITHOUT BLOTTING OR RADIOACTIVITY - APPLICATION TO THE ANALYSIS OF HEPATITIS-B VIRUS IN HUMAN-SERUM
REC Reference Count: 31
CC GENETICS & HEREDITY
RF 88-1699 002; MPTP NEUROTOXICITY; RAT STRIATAL SLICES; 1-METHYL-4-PHENYLPYRIDINIUM (MPP+) INCREASES OXIDATION; NIGROSTRIATAL DOPAMINE PATHWAY
88-0225 001; DNA FRAGMENTS; SOLID-PHASE SYNTHESIS OF ALPHA-ANOMERIC OLIGODEOXYRIBONUCLEOTIDES; PHOSPHORAMIDITE INTERMEDIATES; RAPID NUCLEOTIDE SEQUENCING

L14 ANSWER 15 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 87:382177 SCISEARCH
GA The Genuine Article (R) Number: J0654
TI SOLID SUPPORTED CHEMICAL 5'-PHOSPHORYLATION OF OLIGODEOXYRIBONUCLEOTIDES THAT CAN BE MONITORED BY TRITYL CATION RELEASE - APPLICATION TO GENE SYNTHESIS
REC Reference Count: 6
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
RF 87-2288 001; STRUCTURAL GENE; YEAST SACCHAROMYCES-CEREVISIAE; COMPLETE NUCLEOTIDE-SEQUENCE

L14 ANSWER 16 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 86:636086 SCISEARCH
GA The Genuine Article (R) Number: E7828
TI A CHEMICAL 5'-PHOSPHORYLATION OF OLIGODEOXYRIBONUCLEOTIDES
REC Reference Count: 20
CC GENETICS & HEREDITY; BIOCHEMISTRY & MOLECULAR BIOLOGY
RF 86-0223 004; POLYSTYRENE POLYMER SUPPORT; CHEMICAL SYNTHESIS OF OLIGODEOXYRIBONUCLEOTIDES; PHOSPHATE PROTECTING GROUP; NUCLEIC-ACIDS AUTOMATIC SYNTHESIZING SYSTEM

L14 ANSWER 17 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 86:548266 SCISEARCH
GA The Genuine Article (R) Number: E1784
TI A CHEMICAL 5'-PHOSPHORYLATION OF OLIGODEOXYRIBONUCLEOTIDES THAT CAN BE MONITORED BY TRITYL CATION RELEASE
REC Reference Count: 18
CC CHEMISTRY, ORGANIC
RF 86-0223 002; POLYSTYRENE POLYMER SUPPORT; CHEMICAL SYNTHESIS OF OLIGODEOXYRIBONUCLEOTIDES; PHOSPHATE PROTECTING GROUP; NUCLEIC-ACIDS AUTOMATIC SYNTHESIZING SYSTEM

L14 ANSWER 18 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 86:377651 SCISEARCH
GA The Genuine Article (R) Number: C9349
TI SOLID-SUPPORTED SYNTHESIS, DEPROTECTION AND ENZYMATIC PURIFICATION OF OLIGODEOXYRIBONUCLEOTIDES
REC Reference Count: 13
CC CHEMISTRY, ORGANIC
RF 86-0223 001; POLYSTYRENE POLYMER SUPPORT; CHEMICAL SYNTHESIS OF OLIGODEOXYRIBONUCLEOTIDES; PHOSPHATE PROTECTING GROUP; NUCLEIC-ACIDS AUTOMATIC SYNTHESIZING SYSTEM

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L14 ANSWER 2 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 1998:10974 SCISEARCH
GA The Genuine Article (R) Number: YL589
TI Chemical synthesis and characterization of branched oligodeoxyribonucleotides (bDNA) for use as signal amplifiers in nucleic acid quantification assays
AU **Horn T (Reprint)**; Chang C A; **Urdea M S**
CS CHIRON DIAGNOST, 4560 HORTON ST, EMERYVILLE, CA 94608 (Reprint); CHIRON CORP, NUCL ACID DIAGNOST, EMERYVILLE, CA 94608
CYA USA
SO NUCLEIC ACIDS RESEARCH, (1 DEC 1997) Vol. 25, No. 23, pp. 4842-4849. Publisher: OXFORD UNIV PRESS, GREAT CLARENDON ST, OXFORD, ENGLAND OX2 6DP. ISSN: 0305-1048.
DT Article; Journal
FS LIFE
LA English
REC Reference Count: 19
AB The divergent synthesis of bDNA structures is described. This new type of branched DNA contains one unique oligonucleotide, the primary sequence, covalently attached through a comb-like branching network to many identical copies of a different oligonucleotide, the secondary sequence. The bDNA comb molecules were assembled on a solid support using parameters optimized for bDNA synthesis. The chemistry was used to synthesize bDNA comb molecules containing 15 secondary sequences. The bDNA comb molecules were elaborated by enzymatic ligation into branched amplification multimers, large bDNA molecules (a total of 1068 nt) containing an average of 36 repeated DNA oligomer sequences, each capable of hybridizing specifically to an alkaline phosphatase-labeled oligonucleotide. The bDNA comb molecules were characterized by electrophoretic methods and by controlled cleavage at periodate-cleavable moieties incorporated during synthesis. The branched amplification multimers have been used as signal amplifiers in nucleic acid quantification assays for detection of viral infection. It is possible to detect as few as 50 molecules with bDNA technology.
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
STP KeyWords Plus (R): DNA; RNA
RF 95-5061 001; STRUCTURAL GENE; GLTC-DEPENDENT REGULATION OF BACILLUS-SUBTILIS GLUTAMATE SYNTHASE EXPRESSION; ARABIDOPSIS TYPE-1 PROTEIN PHOSPHATASE
RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
CANTOR C R	1970	9	1059	BIOPOLYMERS
CLEGG R M	1993	90	2994	P NATL ACAD SCI USA
COLLINS M L	1997	25	2979	NUCLEIC ACIDS RES
HAUGLAND R P	1990		143	OPTICAL MICROSCOPY B
HORN T	1997	25		IN PRESS NUCL ACIDS
HORN T	1989	17	6959	NUCLEIC ACIDS RES
HORN T	1989	8	875	NUCLEOS NUCLEOT
HORN T	1986	27	4705	TETRAHEDRON LETT
HORN T	1995	36	2033	TETRAHEDRON LETT
KOLBERG J A	1997			GENE QUANTIFICATION
MELLORS J W	1995	122	573	ANN INTERN MED
MORRISON L E	1995		430	NONISOTOPIC PROBING
MULLIS K B	1987	155	335	METHOD ENZYMOL
ORITO E	1994	44	410	J MED VIROL

825-872

PERELSON A S	1996	271	182	SCIENCE
SAMBROOK J	1989			MOL CLONING LAB MANU
URDEA M S	1991	24	197	NUCL ACIDS RES S SER
URDEA M S	1988	16	4937	NUCLEIC ACIDS RES
URDEA M S	1983	80	7461	P NATL ACAD SCI USA

L14 ANSWER 3 OF 18 SCISEARCH COPYRIGHT 2001 ISI (R)
AN 1998:10973 SCISEARCH
GA The Genuine Article (R) Number: YL589
TI An improved divergent synthesis of comb-type branched oligodeoxyribonucleotides (bDNA) containing multiple secondary sequences
AU **Horn T (Reprint)**; Chang C A; **Urdea M S**
CS CHIRON DIAGNOST, NUCL ACIDS DIAGNOST, EMERYVILLE, CA 94608 (Reprint)
CYA USA
SO NUCLEIC ACIDS RESEARCH, (1 DEC 1997) Vol. 25, No. 23, pp. 4835-4841. Publisher: OXFORD UNIV PRESS, GREAT CLARENDON ST, OXFORD, ENGLAND OX2 6DP. ISSN: 0305-1048.
DT Article; Journal
FS LIFE
LA English
REC Reference Count: 36
AB The divergent synthesis of branched DNA (bDNA) comb structures is described. This new type of bDNA contains one unique oligonucleotide, the primary sequence, covalently attached through a comb-like branch network to many identical copies of a different oligonucleotide, the secondary sequence. The bDNA comb structures were assembled on a solid support and several synthesis parameters were investigated and optimized. The bDNA comb molecules were characterized by polyacrylamide gel electrophoretic methods and by controlled cleavage at periodate-cleavable moieties incorporated during synthesis. The developed chemistry allows synthesis of bDNA comb molecules containing multiple secondary sequences. In the accompanying article we describe the synthesis and characterization of large bDNA combs containing all four deoxynucleotides for use as signal amplifiers in nucleic acid quantification assays.
CC BIOCHEMISTRY & MOLECULAR BIOLOGY
STP KeyWords Plus (R): PROTECTING GROUP; NUCLEIC-ACIDS; DNA; OLIGONUCLEOTIDES; CLEAVAGE; INVITRO; ANALOGS
RF 95-5061 001; STRUCTURAL GENE; GLTC-DEPENDENT REGULATION OF BACILLUS-SUBTILIS GLUTAMATE SYNTHASE EXPRESSION; ARABIDOPSIS TYPE-1 PROTEIN PHOSPHATASE
RE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)
AZHAYEV A	1993	34	6435	TETRAHEDRON LETT
BALGOBIN N	1982	20	198	CHEM SCRIPTA
BALGOBIN N	1981	22	3667	TETRAHEDRON LETT
BARANY F	1991	88	189	P NATL ACAD SCI USA
BLANKESPOOR R L	1984	49	4441	J ORG CHEM
BRAICH R S	1997	8	370	BIOCONJUGATE CHEM
BRANDENBURG G	1995	5	791	BIOORG MED CHEM LETT
GIOELI C	1982		672	J CHEM SOC CHEM COMM
GIOELI C	1981	22	969	TETRAHEDRON LETT
GROTLI M	1997	53	11317	TETRAHEDRON
HORN T	1997	25		IN PRESS NUCL ACIDS
HORN T	1989	17	6959	NUCLEIC ACIDS RES
HORN T	1989	8	875	NUCLEOS NUCLEOT
HORN T	1991	10	299	NUCLEOS NUCLEOT
HUDSON R H E	1993	115	2119	J AM CHEM SOC

HUDSON R H E	1995	117	12470	J AM CHEM SOC
KATZHENDLER J	1989	45	2777	TETRAHEDRON
KEITH G	1974	13	3601	BIOCHEMISTRY-US
KEMP D S	1977		1031	TETRAHEDRON LETT
KOCHETKOV N K	1972			ORGANIC CHEM NUCL 2
LETSINGER R L	1967	89	7146	J AM CHEM SOC
LETSINGER R L	1968		2621	TETRAHEDRON LETT
MULLIS K B	1987	155	335	METHOD ENZYMOL
OGILVIE K K	1973	51	3799	CAN J CHEM
PERSING D H	1989	62	159	YALE J BIOL MED
PON R T	1988	6	768	BIOTECHNIQUES
RAMAGE R	1991	47	8001	TETRAHEDRON
SAMBROOK J	1989			MOL CLONING LAB MANU
SCHIRMEISTER H	1993	76	385	HELV CHIM ACTA
THRANE H	1995	51	10389	TETRAHEDRON
URDEA M S	1988	16	4937	NUCLEIC ACIDS RES
URDEA M S	1986	27	2933	TETRAHEDRON LETT
VANBOOM J H	1976		4875	TETRAHEDRON LETT
WINDHOLZ T B	1967		2555	TETRAHEDRON LETT

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